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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/623,750	07/21/2003	Darryn Lowe	CML01066AC	6351

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EXAMINER

GOGIA, ANKUR

ART UNIT	PAPER NUMBER
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2187

DATE MAILED: 08/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

87

Office Action Summary

Application No.

10/623,750

Applicant(s)

LOWE ET AL.

Examiner

Ankur Gogia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9 and 11-16 is/are rejected.
- 7) ☒ Claim(s) 6, 10 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/21/2003</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The instant application having Application No. 10/623,750 has a total of 17 claims pending in the application; there are 3 independent claims and 14 dependent claims, all of which are ready for examination by the examiner.

Claim Objections

2. Claim 13 is objected to because of the following informalities: Page 34 Line 10 states "more remote storage" where it is believed that the Applicant meant "more remote storage devices" and has been treated as such for this Office Action.

Appropriate correction is required.

Oath/Declaration

3. The Applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in 37 C.F.R. 1.63.

Information Disclosure Statement

4. As required by M.P.E.P. 609(c), the Applicant's submission of the Information Disclosure Statement dated July 21, 2003 is acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending. As required by M.P.E.P. 609(c)(2), a copy of the PTOL-1449 initialed and dated by the examiner is attached to the instant Office Action.

Specification

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The specification lacks antecedent basis for the “computer usable medium having a computer readable program code” as mentioned on Page 34, Claim 13, Lines 6-7.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 7-8, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Cabrera et al. (U.S. 6,269,382 B1).

Claim 7

A system for managing storage of at least one item in a network of heterogeneous storage devices (Col. 7 Line 64 – Col. 8 Line 4; Col. 9 Lines 24-34), the system comprising:

an event detection module, the event detection module detecting storage events on the heterogeneous storage devices (Col. 10 Lines 30-35; Col. 13 Lines 19-21 and Lines 35-38);

an input provider module, the input provider module providing item metrics and storage device metrics (Col. 10 Lines 41-45; Col. 13 Lines 23-24);

a decision engine, the decision engine being connected to the input provider module and the event detection module, the decision engine determining storage assignment, the storage assignment assigning the item to one or more of the heterogeneous storage devices based on item-device suitability (Col. 14 Lines 36-53); and

a storage assignment implementation module connected to the decision engine, the storage assignment implementation module storing the item on one or more of the heterogeneous storage devices in accordance with the storage assignment (Col 13 Lines 16-19).

Note that although the above references refer to the “hierarchical storage manager” and not specifically to an event detection module, an input provider module, a decision engine, or a storage assignment implementation module, the hierarchical storage manager performs these functions and therefore it is inherent that these modules are a part of the hierarchical storage manager.

Claim 8

The system as recited in claim 7 wherein the input provider module is centrally implemented in the network of heterogeneous storage devices (Fig. 4 Item 74).

Note that although this reference points to the hierarchical storage manager, as discussed above in claim 7 the hierarchical storage manager incorporates the input provider module.

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Claim 11

The system as recited in claim 7 wherein the decision engine is centrally implemented in the network of heterogeneous storage devices (Fig. 4 Item 74).

Note that although this reference points to the hierarchical storage manager, as discussed above in claim 7 the hierarchical storage manager incorporates the decision engine.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 3-5, 9, 12-13, and 15-16 are rejected under 35 U.S.C. 103(a) as being obvious over Cabrera et al. (U.S. 6,269,382 B1) in view of examiner's taking of official notice.

Claim 1

Cabrera et al. disclose a method of managing storage of at least one item in a network of heterogeneous storage devices (Col. 7 Line 64 – Col. 8 Line 4; Col. 9 Lines 24-34), the heterogeneous storage devices comprising a local storage device (Col. 8 Lines 4-5) and one or more remote storage devices (Col. 8 Lines 6-7) comprising:
detecting a storage event (Col. 10 Lines 30-35)

obtaining input information, the input information having parameter values related to the item and the heterogeneous storage devices (Col. 10 Lines 41-45) and;

processing the input information to determine a storage assignment (Col. 14 Lines 42-53), the storage assignment being determined for storage of the item on one or more of the heterogeneous storage devices based on item-device suitability determined from a combination of at least one item selection rule and at least one storage selection rule (Col. 14 Lines 47-53)

Cabrera et al. do not expressly state the detection being effected by the local storage device. However, they disclose in Col. 8 Lines 31-37 that their invention may be practiced in a distributed computing environment in which the various modules are located in both local and remote memory storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teaching of Cabrera et al. before them, to distribute the storage detection over the entire distributed environment. The motivation for doing so would have been an increased system performance. By having the events detected at each site rather than at a central site the system would no longer have to send information to the central site to determine if an event has occurred resulting in faster event detection.

Claim 3

Cabrera et al. disclose the method as recited in claim 1 wherein processing the input information if the event is an item optimization event (Col. 17 Lines 44-59). They do not expressly state determining suitability of one or more remote items for storing the

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remote items on the local storage device, wherein the remote items are items located on the remote storage devices; and determining the storage assignment, the storage assignment comprising a list of remote items for storing the remote items on the local storage device. However, Cabrera et al. disclose determining suitability of one or more **local** items for storing on the **remote** storage device and determining a storage assignment comprising a list of **local** items for storing on the **remote** storage device (Col. 17 Lines 44-59).

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teaching of Cabrera et al. before them, to incorporate storage of remote items on the local device when processing an optimization event, because doing so would provide for greater optimization of the system.

Claim 4

The method as recited in claim 1 wherein processing the input information if the event is a device full event (Col. 12 Lines 25-26) comprises:

determining suitability of one or more local items for relocating the local items, wherein the local items are the items located on the local storage device (Col 12 Lines 36-45);

selecting a list of local items that are to be relocated (Col. 12 Lines 36-45);

determining suitability of the remote storage devices for storing the selected local items; and

determining storage assignment, the storage assignment comprising a list of destination storage devices, the destination storage devices being the remote storage devices that are suitable for storing the selected local items (Col. 12, Lines 36-56).

Note that although Cabrera et al. do not specifically state determining suitability of the remote storage devices or determining the storage assignment in Col. 12 Lines 36-56, in the described embodiment the items are in the "pre-migration" state and for them to have reached this state the suitability of the remote storage devices and the storage assignment must have already been determined (Col. 10 Lines 24-39).

Claim 5

The method as recited in claim 1 wherein the method further comprises storing the item on the heterogeneous storage devices in accordance with the storage assignment (Col. 15 Lines 41-45).

Claim 9

Cabrera et al. disclose the system as recited in claim 7 stated above. They do not expressly state the input provider module being implemented on each storage device in the network. However, they disclose in Col. 8 Lines 31-37 that their invention may be practiced in a distributed computing environment in which the various modules are located in both local and remote memory storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teaching of Cabrera et al. before them, to implement the input provider module on each storage device. The motivation for doing so would have been an increased system performance. By having the input provider module at each site

rather than at a central site the system would be able to have each site provide the necessary input information rather than having the central site determine which site to request the input from and waiting for these sites to respond.

Claim 12

Cabrera et al. disclose the system as recited in claim 7 stated above. They do not expressly state the decision engine being implemented on each storage device in the network. However, they disclose in Col. 8 Lines 31-37 that their invention may be practiced in a distributed computing environment in which the various modules are located in both local and remote memory storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teaching of Cabrera et al. before them, to implement the decision engine on each storage device. The motivation for doing so would have been an increased system performance. By having the decision engine at each site rather than at a central site the system would be able to have each site make decisions on how to store items on at that site rather than having the central site make decisions for all sites.

Claim 13

Cabrera et al. disclose a computer program product for use with a computer, the computer program product comprising a computer usable medium having a computer readable program code (Col. 7 Lines 45-56) embodied therein for managing storage of at least one item in a network of heterogeneous storage devices (Col. 7 Line 64 – Col. 8 Line 4; Col. 9 Lines 24-34), the heterogeneous storage devices comprising a local

storage device (Col. 8 Lines 4-5) and one or more remote storage (Col. 8 Lines 6-7), the computer program code performing:

- detecting a storage event (Col. 10 Lines 30-35) on the local storage device;
- obtaining input information, the input information having parameter values related to the item and the heterogeneous storage devices (Col. 10 Lines 41-45); and
- processing the input information to determine a storage assignment (Col. 14 Lines 42-53), the storage assignment being determined for storage of the item on one or more of the heterogeneous storage devices based on item-device suitability determined from a combination of at least one item selection rule and at least one storage selection rule (Col. 14 Lines 47-53)

Cabrera et al. do not expressly state the detection being effected by the local storage device. However, they disclose in Col. 8 Lines 31-37 that their invention may be practiced in a distributed computing environment in which the various modules are located in both local and remote memory storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teaching of Cabrera et al. before them, to distribute the storage detection over the entire distributed environment. The motivation for doing so would have been an increased system performance. By having the events detected at each site rather than at a central site the system would no longer have to send information to the central site to determine if an event has occurred resulting in faster event detection.

Claim 15

Cabrera et al. disclose the computer program product as recited in claim 13 wherein the computer program code performing the processing of the input information if the event is an item optimization. (Col. 17 Lines 44-59)

They do not expressly state determining suitability of one or more remote items for storing the remote items on the local storage device, wherein the remote items are items located on the remote storage devices; and determining the storage assignment, the storage assignment comprising a list of remote items for storing the remote items on the local storage device. However, Cabrera et al. disclose determining suitability of one or more **local** items for storing on the **remote** storage device and determining a storage assignment comprising a list of **local** items for storing on the **remote** storage device (Col. 17 Lines 44-59).

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teaching of Cabrera et al. before them, to incorporate storage of remote items on the local device when processing an optimization event, because doing so would provide for greater optimization of the system.

Claim 16

The computer program product as recited in claim 13 wherein the computer program code performing processing of the input information if the event is a device full event (Col. 12 Lines 25-26) comprises a computer program code for performing:

determination of suitability of one or more local items for relocating the local items, wherein the local items are the items located on the local storage device (Col 12 Lines 36-45);

selection of a list of local items that are to be relocated (Col. 12 Lines 36-45);
determination of suitability of the remote storage devices for storing the selected local items; and

determination of the storage assignment, the storage assignment comprising a list of destination storage devices, the destination storage devices being the remote storage devices that are suitable for storing the selected local items.

Note that although Cabrera et al. do not specifically state determining suitability of the remote storage devices or determining the storage assignment in Col. 12 Lines 36-56, in the described embodiment the items are in the "pre-migration" state and for them to have reached this state the suitability of the remote storage devices and the storage assignment must have already been determined (Col. 10 Lines 24-39).

10. Claims 2 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cabrera et al. as applied to claims 1 and 13 above, and further in view of Adya et al. (U.S. 2002/0188605 A1).

Cabrera et al. disclose the limitations of claims 1 and 13 as stated above, however they do not disclose expressly the method as recited in claim 1 or the computer program product as recited in claim 13 wherein processing the input information if the event is an item addition event comprises: determining suitability of the heterogeneous storage devices in the network for storing an added item, the added item

being the item that is added to the local storage device; and determining the storage assignment, the storage assignment comprising a list of destination storage devices, the destination storage devices being optimal locations for storing the added item.

Adya et al. disclose a serverless distributed file system wherein when a file is created and stored on the distributed file system, the storage location of the file is automatically determined by the distributed file system manager based on various factors (Paragraphs 28 and 29).

Cabrera et al. and Adya et al. are analogous art because they are from the same field of endeavor of managing storage in a distributed file system.

At the time of the invention it would have been obvious to a person of ordinary skill in the art, having the teachings of Cabrera et al. and Adya et al. before them, to have the distributed file system automatically determine the storage location of a newly created item based on various parameters of the item and the system. The motivation for doing so would have been by dynamically storing newly created files, the file would be placed in a manner to further optimize the file system.

Therefore, it would have been obvious to combine Adya et al. with Cabrera et al. for the benefit of optimizing the distributed file system to obtain the invention as specified in claims 2 and 14.

Conclusion

11. The following is a summary of the treatment and status of all claims in the application as recommended by M.P.E.P 707.07(i)

a. Claims 6, 10 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reasons for allowance of claims 6, 10 and 17 in the instant application is the combination with the inclusion in these claims that **deadlock between storage assignments be avoided**. The prior art of record neither anticipates nor renders obvious the above recited combination.

If the Applicant should choose to rewrite the independent claims to include the limitations recited in either one of claims 6, 10 and 17, the Applicant is encouraged to amend the title of the invention such that it is descriptive of the invention as claimed as required by sec. 606.01 of the M.P.E.P. Furthermore, the Summary of the Invention and the Abstract should be amended to bring them into harmony with the allowed claims as required by paragraph 2 of sec. 1302.01 of the M.P.E.P.

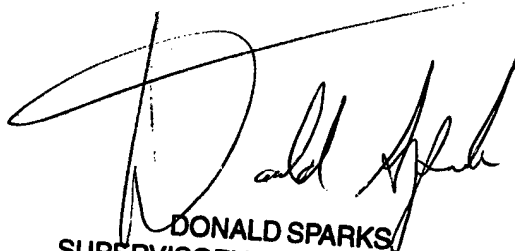
As allowable subject matter has been indicated, Applicant's response must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 C.F.R. 1.111(b) and 707.07(a) of the M.P.E.P.

b. Per the instant Office Action, claims 1-5, 7-9 and 11-16 have received a first action on the merits and are subject of a first action non-final.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ankur Gogia whose telephone number is 571-272-4166. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on 571-272-4201. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DONALD SPARKS
SUPERVISORY PATENT EXAMINER

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